

Preliminary ACD Power Estimate - w/Analog ASIC**Typical Power**

1. Electronics needed for each Channel

	QTY	Typical Power			145 Tiles	65 Tiles
		+5V Icc/part	+5V Power/part	+28V Power/part		
PMT w/ Cockcroft-Walton HVPS	1			50mW	0.05W	7.25W
FEE Analog ASIC (w/DACs & M	1	4.0mA	20mW		0.02W	2.90W
ADC (Burr-Brown ADS7816)	2	0.4mA	2mW		0.00W	0.58W
Misc. Analog (Op-Amps/V-Ref.,	1	2.0mA	10mW		0.01W	1.45W
TOTALS					0.08W	12.18W
						5.46W

Typical Power

2. Electronics needed every 4 channels with LVDS interface enabled

	QTY	Typical Power			145 Tiles
		+5V Icc/part	+5V Power/part	+28V Power/part	
FPGA (Atmel AT6010)	1	125.0mA	625mW		0.63W
LVDS Driver (DS90C031)	3	16.0mA	80mW		0.24W
LVDS Receiver (DS90C032)	1	3.5mA	18mW		0.02W
Misc. HC Logic (Octal Buffers &	6	0.2mA	1mW		0.01W
Misc. HC Logic (F/F, gates {HC'	2	0.1mA	1mW		0.00W
TOTALS					0.89W

Typical Power

3. Electronics needed every 4 channels with LVDS interface disabled

	QTY	Typical Power			145 Tiles	65 Tiles
		+5V Icc/part	+5V Power/part	+28V Power/part		
FPGA (Atmel AT6010)	1	125.0mA	625mW		0.63W	22.50W
LVDS Driver (DS90C031)	3	2.2mA	11mW		0.03W	1.19W
LVDS Receiver (DS90C032)	1	3.5mA	18mW		0.02W	0.63W
Misc. HC Logic (Octal Buffers &	6	0.2mA	1mW		0.01W	0.22W
Misc. HC Logic (F/F, gates {HC'	2	0.1mA	1mW		0.00W	0.04W
TOTALS					0.68W	24.57W
						10.92W

ACD Power Estimates

A) Baseline ACD - 145 Tile configuration

	Power/ch	Power/ 4 ch	# needed	TOTAL Power
1. Electronics needed for each Channel	0.08W		145	12.18W
2. Electronics needed every 4 channels with LVDS interface <u>enabled</u>		0.89W	1	0.89W
3. Electronics needed every 4 channels with LVDS interface <u>disabled</u>		0.68W	36	24.57W
TOTALS(w/o power ineff.)				37.64W
Power Converter Inefficiency (75% efficiency)				12.55W
TOTALS				50.19W
TOTALS w/ 25% contingency				62.73W

B) ACD 2nd Option/Descope - 65 Tile configuration

	Power/ch	Power/ 4 ch	# needed	TOTAL Power
1. Electronics needed for each Channel	0.08W		65	5.46W
2. Electronics needed every 4 channels with LVDS interface <u>enabled</u>		0.89W	1	0.89W
3. Electronics needed every 4 channels with LVDS interface <u>disabled</u>		0.68W	16	10.92W
TOTALS(w/o power ineff.)				17.27W
Power Converter Inefficiency (75% efficiency)				5.76W
TOTALS				23.03W
TOTALS w/ 25% contingency				28.78W